

Deficiency Response List
Task ID #3016
Bath House Parking Lot Expansion

R645-301-521.190,

- D. The Permittee must update the permit area acreage in Chapter 1, Page 1-5. In addition, the permittee must also include information on the acreage of the disturbed area.**
- R. Please find Page 1-5 attached to this response.**

R645-301-120,

- D. The Permittee must address the apparent pagination discrepancy with Page 7-135 of the submittal. Page 7-135 of the submittal appears to correspond to page 7-106 in the approved MRP.**
- R. Hiawatha Coal's MRP does not show this discrepancy, page 7-106 describes diversions (742.300). Page 7-135 describes "Area AD-8 Drainage, 1993" and "Ditch D-8D Water Bar/C-14D" specifically.**

R645-301-120,

- D. The Permittee needs to modify the language on page 7-135 that describes culvert C-14D. The Language should make it clear to the reader as to what is currently in use at the site. Future tense is utilized in describing the 8" concrete slab associated with the removed water bar.**
- R. Please find the revised page 7-135 with the corrected language attached to this response.**

R645-301-120,

- D. The C2 form indicates Plates 2-2B was part of the submittal, but that plate was not in either the hard copy or the electronic version on the CD's. The Permittee needs to correct the C2 form for the next submittal.**
- R. Please find the corrected C2 Form attached to this response.**

R645-301-521.151,

- D. The permittee must provide the Division with a map that clearly indicates sufficient slope measurements or surface contours to adequately represent the existing land surface configuration of the proposed permit area for at least 100 feet beyond the limits of mining disturbance.**
- R. Please refer to the revised Plate 2-3B, which shows extended topography to the west and a cross-section E-E' located on Page 5I-78 also included in this response.**

R645-301-512.100,

- D. The permittee must provide the Division with a certified copy of Plate 5-2B, Surface Facilities**
- R. Hiawatha Coal will provide the Division with certified copies of all plates included in this submittal upon approval.**

File in:

Confidential
 Shelf
 Expandable

Refer to Record No 0039 Date 7252008
In C10150025 2008 Incoming
For additional information

R645-301-526.200,

- D. **The permittee must update the MRP to show that additions that they made to the surface facilities. The information in Appendix 5-A to include the new structures, start dates and estimated completion dates.**
- R. Hiawatha Coal Company is not adding any new structures with this submittal. Rather we are just adding cut-fill volumes and some asphalt removal which have been addressed on Page 8-5 and 8-20 in this submittal.

R645-301-231.100,

- D. **The plan must provide information on topsoil sampling in accordance with Table 2-4 and indicate volumes of topsoil salvaged from the expansion.**
- R. The soil samples are located in Appendix 2-A for the DZE soil types. Hiawatha Coal proposes that the soil samples taken along the Tank Seam access road are indicative of the TR type soils located in the area of Bear Canyon Mine and are identified as TSA-1 and TSA-2 located in Appendix 2-A.

R645-301-231.100,

- D. **South of the existing shower house pad, in DZE soils, the plan needs to indicate a minimum of ten inches will be salvaged.**
- R. Hiawatha Coal Company fully intends to follow the topsoil recovery plan already outlined in the MRP under Sec R645-301-231, page 2-14 and R645-301-232, page 2-30.

R645-301-232.200,

- D. **The plan must indicate that six inches of topsoil will be salvaged from the TR soil on the slopes west of the shower house pad.**
- R. Hiawatha Coal Company fully intends to follow the topsoil recovery plan already outlined in the MRP and will recover a minimum of 6" of topsoil and or subsoil where ever possible along the western slopes of the proposed expansion area.

R645-301-231.400,

- D. **The plan must describe the construction or modification of existing topsoil storage areas for placement of the topsoil salvaged.**
- R. Hiawatha Coal Company fully intends to follow the topsoil Plan already in the approved MRP. Hiawatha Coal Company intends to place any recovered topsoil in either one or both of the Main or the Wild Horse Ridge Tank Seam Topsoil piles. Hiawatha Coal proposes that the affected topsoil pile Plates be updated after final placement of the topsoil.

R645-301-121.200,

- D. Page 8-20 of this application seems to indicate that Sediment Pond “A” cut and fill requirements are reduced by approximately 40,000 cu yds. The plan must explain how this expansion impacts Sediment Pond “A”.**
- R. The Proposed plan does not impact Sediment Pond “A”. Page 8-20 was updated in the TS-4 area to simply add the “Subtotal” statement to clean the page up and the difference is a conversion from cu-ft to cu-yds. The actual changes pertaining to this submittal are in the TS-9 Subtotals for the Shower House and Sediment Pond “C”.
- D. Table 2-7 (page 2-34) records acreage disturbed for each reclamation area. TS-9 acreage must be updated to include this post-law disturbance.**
- R. Please find the revised Table 2-7, page 2.34 attached to this response.

D. Table 2-8 must be updated with information from this expansion.

- R. Please find the revised Table 2-8, page 2.35 attached to this response.

R645-301-742.220, -221.31, -221.3 and -221.33,

- D. The permittee must update the Sediment Pond “C” calculations within Appendix 7-F of the MRP. The Permittee must demonstrate that Sediment Pond “C” has the storage capacity to handle the increase in storm water volume that will be generated from the parking lot expansion.**
- R. Please find the revised Sediment Pond “C” Calculations for Storage Capacity included in this response.

R645-301-542.300,

- D. The permittee must provide the Division with a certified copy of Plate 2-3B, Reclamation Area.**
- R. Hiawatha Coal will provide the Division with certified copies of all plates included in this submittal upon approval.

R645-301-830.140,

- D. The permittee must update the Bond Calculation in Appendix 8-A.**
- R. Please find the appropriate Calculation sheets for the associated areas attached to this response. Please be aware these are subject to an approval on the Bear Mid-Term Review, Task # 2935.

Plate 1-1 shows the Permit Area, Plate 1-2 shows Surface Ownership, Plate 1-3 shows Sub-Surface Ownership. The initials COP on the plates stand for C.O.P. Coal Development Company. Table 1-3 lists the owners of the surface and mineral property rights within the permit area.

Federal lease U-024316, U-024318, U-020668, U-38727, U-46484, U-61048, and U-61049 are held by C.O.P. Coal Development Co. Fee Surface Area and Fee and Federal Coal Rights are leased by Co-Op Mining Company from C.O.P. Coal Development Co. (See letter from C.O.P. Coal Development Company, Appendix 2-A).

The lease guarantees Co-Op the right to mine and remove from, and for purposes incident to mining, including access roads, camp facilities, surface operations, storage of coal, and other activities; also unrestricted use of all access roads leading to and from the property.

A total of 10,991.83 10,992.45 acres are included in the permit area. This includes 6,615.43 acres of federal coal and 4,376.40 4,377.02 acres of private coal owned by C. O. P. Development. The total disturbed acreage within the permit area is approximately 40.64 acres.

Following is a description of the Permit Area.

Table 2-7 Reclamation Area Summary

MARK ¹	DESCRIPTION	Total ac. ^{1,2,3}	Re-contour acres ^{1&3}	Pre-1977 acres ²	New acres
TS-1	Ball Park Topsoil Pile	1.27	0.0	-0-	1.27
TS-2	Lower Haul Road	1.6	0.0	1.6	-0-
TS-3	Sed Pond B & Scale Office Pad	2.60	1.41	1.23	1.37
TS-4	Sed Pond A	0.75	0.75	-0-	0.75
TS-5	Main Pad Area	12.32	9.41	8.89	3.43
TS-6	Portal Access Road	3.25	3.25	0.02	3.23
TS-7	Blind Canyon Seam Portal Area	1.81	1.81	0.51	1.30
TS-8	Upper Storage Pad	0.87	0.83	-0-	0.87
TS-9	Shower House Pad	1.83-2.19	1.83-2.19	-0-	1.83 2.19
TS-10	Tank Seam Access Road	2.91	2.91	-0-	2.91
TS-11	Tank Seam Portal Pad	0.66	0.59	-0-	0.66
TS-12	Wild Horse Ridge Access Road	3.26	0.22	-0-	3.26
TS-13	Conveyor belt Access/Topsoil	1.50	1.14	-0-	1.50
TS-14	Upper Conveyor belt Access Road	.96	0.66	-0-	0.96
TS-15	WHR Blind Canyon Seam Portal Area	1.58	1.58	-0-	1.58
TS-16	WHR TS Lower Portal Access Road	0.89	0.0	-0-	0.89
TS-17	WHR TS Upper Access Road and Pad	2.22	1.74	-0-	2.22
TOTAL		40.28 40.64	28.13 28.49	12.25	28.03 28.39

Notes:

1. See Plates 2-3.
2. See Plates 5-2.
3. The total acres represent acreage which will be reclaimed. Some of the acres will not require re-contouring or regrading during reclamation. The "Re-contour acres" represent the total acres which will require regrading. The "Total acres" shown will be reclaimed in accordance with the reclamation plan.

The proposed substitute topsoil material will be re-tested in the final five years of operations according to [Table 5O-1](#) and will include Total Petroleum Hydrocarbons by EPA Methods 8015 and 418.1. The location of these samples will correlate with the areas generating the most substitute topsoil material as described in [Appendix 5-I](#). Following regrading, soils remaining on the surface as substitute topsoil material will be sampled for pH, EC, and Total Hydrocarbons by EPA method 8015 for diesel fuel and 418.8 for waste oil.

Table 2-8 Substitute Topsoil Summary

Location	Topsoil Amounts Required			Substitute Topsoil Generated from Cuts (cu. yd.)			
	Area (acres)	Depth (in.)	Volume (cu. yd.)	Topsoil Stockpile	Sub. Topsoil Generated	Sub. Topsoil Not Regraged	Total Topsoil
TS-3	1.41	12	2,275	0	2,080	2,563	4,643
TS-4	.75	10	1,008	0	1,008	0	1,008
TS-5	9.41	12	15,181	0	20,814	4,537	25,351
TS-6	3.25	12	5,243	0	7,111	0	7,111
TS-7	1.81	12	2,920	0	4,170	0	4,170
TS-8	.83	12	1,339	0	3,552	0	3,552
TS-9	1.83 2.19	12	2,952 3,533	1,200 1,851	3,761	0	4,961 5,612
Total			36,452 37,033				50,796 51,447

**Table 5I-1 - Cut and Fill Summary
Areas TS-3 Through TS-9**

Area	Fill (-) Volume (cu. yd.)	Cut (+) volume (cu. yd.)	Excess Volume (cu. yd.) ¹
TS-3	1,454	1,468	14
TS-4	3,460	3,473	13
TS-5	25,157	39,907	14,750
TS-6	5,573	8,126	2,553
TS-7	18,037	6,445	-11,592
TS-8	7,022	3,666	-3,356
TS-9	5,854 10,954	5,889 10,911	38 -43
Cumulative Balanced Volume (cu. yd.) =			2,420 2,377

¹ An excess volume of 2,420 cu. Yds. will be generated based on the contours shown on Plates 5-6. This excess is generated in Reclamation Area TS-5, and demonstrates that there is adequate material for reclamation. During reclamation, actual contours in TS-5 can be varied in the areas of cut to eliminate this excess cut. This excess material may also be used to cover any soil found to be unsuitable at the time of reclamation.

TS-9 Sediment Pond C and Bathhouse Pad

The material generated for the bathhouse parking area will be used as fill material for Sediment Pond C and the ditch leading from the Bathhouse Pad to Sediment Pond C. The 1,200 cu. yd. topsoil stockpile created during the construction of the bathhouse pad will be used in conjunction with the substitute topsoil generated from the bathhouse pad.

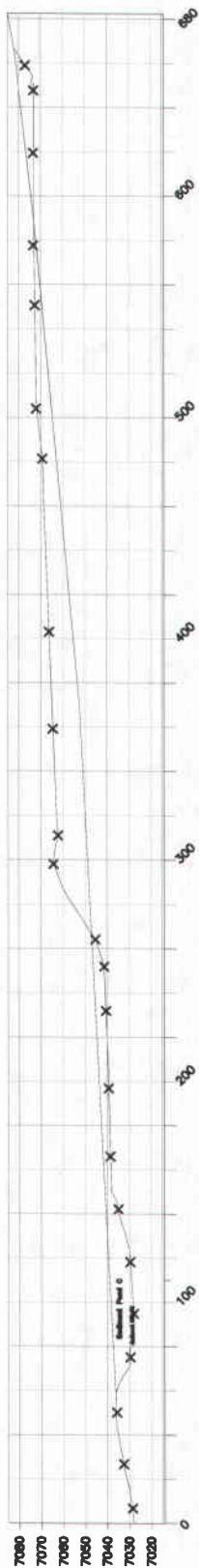
Table 5I-8 - Area TS-9 Cut & Fill summary

Section	Fill (-) Volumes (cu. yd.)			Cut (+) Volumes (cu. yd.)			Volume Cumulative (cu. yd.)
	Topsoil	Substitute Topsoil	Regular Soil	Topsoil	Substitute Topsoil	Regular Soil	
D-D	1,200*	1,762	<u>2,899*</u> <u>7,992</u>	<u>1,200</u> <u>1,483</u>	2,561	<u>2,128</u> <u>6,867</u>	<u>28</u> <u>-43</u>

* It was assumed that sediment Pond C would contain 98 cu. yd. of sediment at the start of reclamation. 1,200 cu. yd. of material will come from the Wild Horse Ridge topsoil stockpile, which was originally recovered from the Bathhouse Pad.

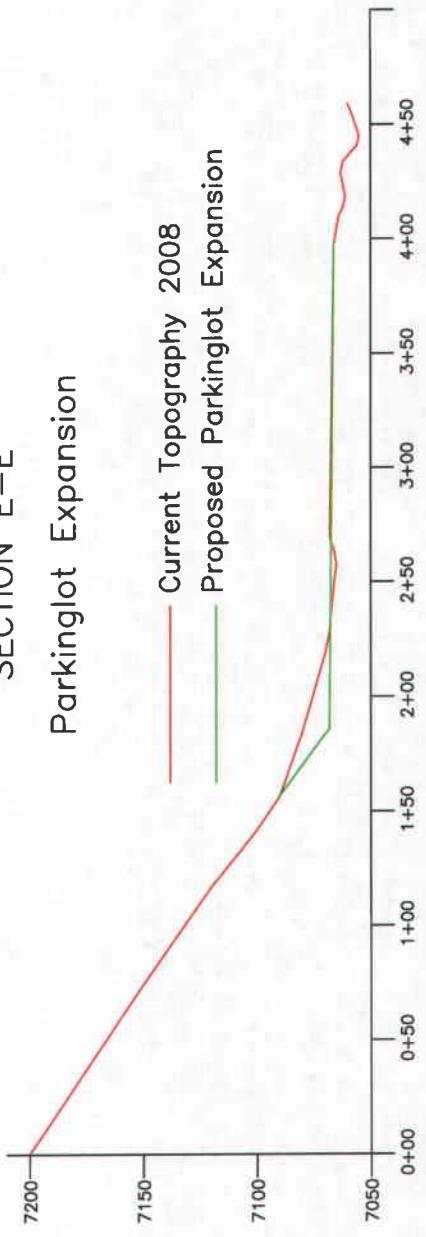
SECTION D-D'
SEDIMENT POND "C"

— PRE-MINING/POST-MINING
××× OPERATION



SECTION E-E'

Parkinglot Expansion



SEDIMENT POND "C" CALCULATIONS

SOIL EROSION TO POND "C"

Use the modified Universal Soil Loss Equation:

$$A = R * K * LS * VM$$

Ref: Israelson, C.E., J.E. Fletcher, F.W. Haws, E.K. Israelson, 1984. Erosion and Sedimentationin Utah: A Guide for Control. Utah Water Research Laboratories, Logan, Utah.

A = Amount of Soil loss per unit area
 R = Rainfall Factor
 K = Soil Erodibility Factor
 LS = Topographic Factor
 VM = Erosion Control Factor:
 = 1.2 for bare, compacted soil
 = 0.1 for seedlings, brush

FOR POND "C" _____ >

$$\begin{aligned} R &= 16 \text{ FT-TONS/ACRE/HR} \\ K &= 0.1 \text{ TONS/AC/EI} \end{aligned}$$

$$LS = \frac{(650 + 450s + 65s^2)}{10,000 * s^2} * \left(\frac{l}{72.5} \right)^m$$

l = Slope Length
s = slope steepness

m =
0.2 for 0 < s < 1 %
0.3 for 1 < s < 3 %
0.4 for 3 < s < 5 %
0.5 for s > 5 %



DRAINAGE AREA	SLOPE LENGTH	SLOPE %	LS	VM	A	ACRES	A= (ft³ / yr)
AD-15	530	9.4	2.85	1.2	5.47	2.19	240

Assume 100 lb / ft³ unit soil wt.

Total Sediment Volume = 240 ft³ / yr

Design Events

2 year - 6 Hour	P = 1.0
10 year - 6 Hour	P = 1.5
10 year - 24 Hour	P = 2.1
25 year - 6 Hour	P = 1.8
25 year - 24 Hour	P = 2.7

For 10 Year - 24 Hour storm, P = 2.1 in.

Curve Numbers

Disturbed Area - CN = 90

$$Q = \frac{(P - 0.2S)^2}{P + 0.8S}$$

$$S = \frac{1000}{CN} - 10$$

Watershed	CN	S	Q (in)	Area (AC)	Runoff Vol. (ft³)
AD - 15	90	1.11	1.18	2.19	9381

Total Runoff Volume = 9,381 ft³

To allow a 5 year factor of safety for sediment storage:

Sediment Volume = 1200 ft³

Total Pond Volume = 10,581 ft³



Pond "C" as-built Structure

Stage - Area Data

Elev. (ft)	Area (ft ²)	Vol. (ft ³)	Cummulative Vol. (ft ³)
7026	22	0	0
7027	218	120	120
7028	579	399	519
7029	1051	815	1334
7030	1578	1315	2649
7031	1894	1736	4385
7032	2245	2070	6455
7033	2576	2411	8866
7034	2914	2745	11611
7035	3278	3096	14707
7035.3	3390	1000	15707

Maximum volume below the emergency spillway is 15,707 cubic feet. The required volume for the 10 year - 24 hour storm event is 10,581 cubic feet. Therefore, the structure will contain the required storm event.

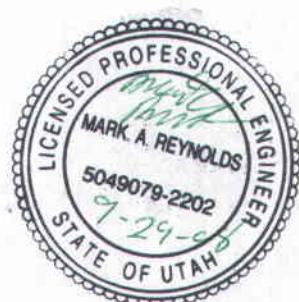


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Table 7-23 Summary of Storm Runoff Calculations for 10 Year 6 Hour Storm

Watershed	Curve Number CN	Time of Concentration (Hr)	Drainage Area (Acres)	Peak Discharge (CFS)
AU-1	76	0.094	6.46	0.83
AU-1A	83	0.032	1.36	0.51
AU-1B	83	0.026	1.16	0.44
AU-1C	76	0.120	16.40-16.04	1.95
AU-2	76	0.075	2.23	0.30
AU-2A	76	0.077	1.64	0.22
AU-2B	76	0.081	3.80	0.51
AU-3	76	0.078	3.87	0.52
AU-3A	76	0.016	0.30	0.05
AU-4	76	0.093	7.97	1.02
AU-4A	83	0.029	0.92	0.35
AU-5	76	0.104	20.14	2.51
AU-6	76	0.059	2.73	0.39
AU-7	76	0.094	13.46	1.72
AU-8	76	0.050	4.95	0.72
AU-9	76	0.100	4.77	0.60
AU-10	76	0.137	35.52	4.05
AU-11	76	0.045	0.62	0.09
AU-12	76	0.050	2.33	0.34
AU-13	76	0.022	0.66	0.10
AU-14	76	0.050	2.43	0.35
AU-15	76	0.058	0.91	0.13
AU-16	76	0.152	44.93	4.92
AU-17	76	0.152	30.10	3.29
AU-18	76	0.152	36.55	4.00
AU-19	76	0.144	36.03	4.03

Table 7-23 Summary of Storm Runoff Calculations for 10 Year 6 Hour Storm (cont)

Watershed	Curve Number CN	Time of Concentration (Hr)	Drainage Area (Acres)	Peak Discharge (CFS)
AD-1A	76	0.090	3.70	0.48
AD-1B	76	0.037	2.12	0.32
AD-2A	76	0.040	0.97	0.15
AD-2B	83	0.025	1.08	0.41
AD-2C	83	0.012	0.25	0.10
AD-3A	76	0.034	1.49	0.23
AD-3B	76	0.034	0.78	0.12
AD-4	83	0.011	0.08	0.03
AD-5	76	0.056	2.13	0.30
AD-6	90	0.220	1.39	0.81
AD-7	90	0.145	2.95	1.83
AD-8 upper	90	0.021	0.70	0.48
AD-8 lower	90	0.247	2.79	1.59
AD-9	90	0.069	0.35	0.23
AD-10 upper	90	0.026	0.30	0.20
AD-10 lower	90	0.078	0.65	0.42
AD-11	95	0.011	0.69	0.65
AD-12 upper	90	0.020	0.22	0.15
AD-12 lower	90	0.076	0.34	0.22
AD-13	91	0.106	1.78	1.23
AD-14	90	0.009	0.08	0.05
AD-15	90	0.069	1.83 2.19	1.20 1.44
AD-16	90	0.030	0.77	1.24
AD-17	90	0.019	0.24	0.16
AD-18	90	0.170	0.9	0.55
AD-19	90	0.009	0.15	0.10
AD-20	90	0.0102	0.65	0.44
AD-21	90	0.0061	0.23	0.16

¹ Sized for the 100 Yr – 6 hr storm event.

Table 7-24 Summary of Division Ditch Calculations

Ditch	Bottom Width (Ft)	Top Width (Ft)	Depth (Ft)	Type Side Slope H:V	Measured Slope %	Contributing Watershed	REQ'D Av. Rip-Rap Size (In.)
D-1D	0	1.33	0.67	1:1	2 Min 11 Max	AD-3A	Soil
D-2D	0	1.33	0.67	1:1	6 Min 20 Max	AD-3A, AD-5	Bedrock
D-3D	0	2	1	1:1	2 Min 6 Av. 18 Max	AD-3A, AD-5, AD-7	Soil Soil Grouted
D-4D	0	2	1	1:1	2 Min 6 Av. 17 Max	AD-14	Soil Soil D_{50} 6"
D-5D	0	1.33	0.67	1:1	4 Min 10 Max	AD-9	Soil
D-6D	0	3	1.5	1:1	2 Min 4 Max	AD-3A, AD-5 AD-7, AD-9, AD-10 AD-12, AD-14	Soil
D-7D	2	3.5	0.75	1.5:1	2 Min 6 Av. 55 Max	AD-1A, AD-1B, AD-2A AD-2B, AD-2C, AD-3B AD-4, AD-6, AD-8	Soil Soil D_{50} 6"
D-8D	0	2	1	1:1	2 Min 7 Max	AD-13	Soil
D-8D Water Bar	0	14	0.33	6:1	3 Av.	AD-13	Soil
D-9D	0.1	2	1	1:1	4 Min 10	AD-15	Soil
D-10D	1	3.33	0.67	1.5:1	7 Min 50	AD-6, AD-3B, (part) AD-2B, AD-2C	D_{50} 4" Bedrock
D-11D	0	1	0.5	1:1	41 Min Near Vert.	Tipple Wash Hose	Grouted Rip-Rap
D-12D	0	1	0.5	1:1	81 Av.	Tipple Wash Hose	Soil
D-13D Water Shed	0	6	0.5	10:1 2:1	0.5 Av.	AD-6 Partial	Soil
D-14D	0	1.33	0.67	1.5:1	0.06 Av.	AU-4A	Soil
D-15D	0	2.00	1.00	1:1	0.05 Av.	AD-16	Soil
D-16D	0	1.50	1.75	1:1	0.05 Av.	AD-18	Soil
D-17D	0	.96	1	1:1	0.08 Av.	AU-23, AD-20	Soil

- Notes:
- Dimensions given indicate minimum requirements. Actual dimensions may vary. Minimum required cross-sections will be maintained.
 - The use of line drainage ditches is required when flow velocities exceed approximately 5 feet per second. Rip-rap may be installed where not required.

Table 7-25 Culvert Characteristics (Cont)

Culvert	Diameter (in.)	Type	Contributing Watersheds	Slope (ft/ft)	Outlet Condition	
C-1D	15	CMP flexible	AD-6, AD-3B	1.00	24" rip-rap	
C-2D	15	CMP, RCP flexible	AD-2B, AD-2C, AD-3B, AD-4, AD-6	4.0	10" rip-rap	
C-3D	20	slt pipe	AD-3A	0.03	4" rip-rap	
C-4D	21	CMP	AD-3A, AD-5, AD-7, AD-14, C-10D	0.18	9" rip-rap	
C-5D	18	CMP	AD-34, AD-5, AD-7, AD-9	0.07	rip-rap	
C-6D	12	CMP	AD-10	0.48	9" rip-rap	
C-7D	18	CMP	Abandoned In Place			
C-8D			Replaced with C-5D-			
C-9D	18	CMP	See C-8D	0.05	3" rip-rap	
C-10D	18	CMP	Tipple Wash Hose	0.03	Soil	
C-11D	12	CMP flexible	AD-4A	0.05 0.25	3" rip-rap	
C-12D	8	CMP	AD-18	0.05	Soil	
C-13D	12	CMP	AU-23, AD-20	0.07	Soil	
C-14D	18	CMP	AD-13	0.06	Soil	

Area AD-8 Drainage, 1993

In 1993, the inlet to [culvert C-7D](#) failed, resulting in NOV 93-35-6-1. In order to eliminate the maintenance problems with [culvert C-7D](#), the south end of drainage area [AD-8](#), the coal storage pad, will be regraded to allow the drainage to flow into [ditch D-7D](#) below the fans shown on [Plate 2-4C](#). At this point, the storage pad is level with [D-7D](#), allowing drainage to easily flow into the ditch. The berm around the coal storage pad will prevent drainage over the edge of the pad and direct the flow toward [ditch D-7D](#). The point at which the storage pad intersects [D-7D](#) is outside of the angle of repose of the coal pile, and the ditch will not be plugged by coal spillage. A catch basin exists just below this point which will trap any coal fines which may be washed into the drainage, protecting [ditch D-7D](#) below this point.

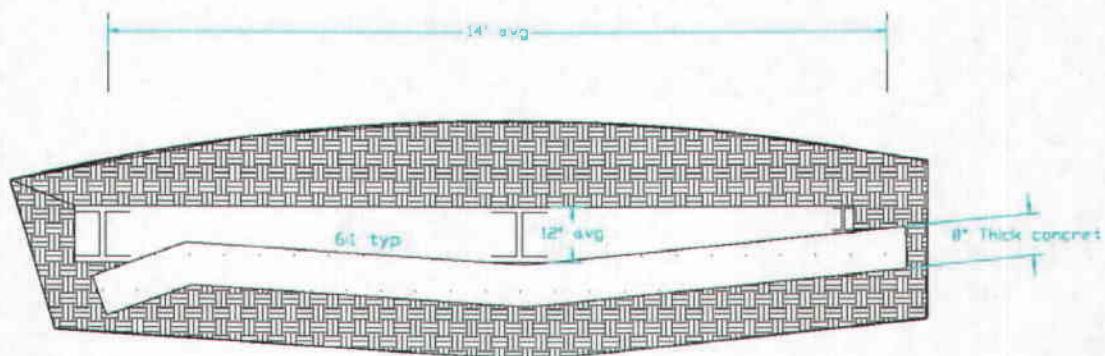
Ditch D-8D Water Bar / C-14D

In 1996, Co-Op observed that erosion problems existed which were associated with the water bar conveying runoff from [Ditch D-8D](#) to the inlet of Sediment Pond "B" as a result of water associated with the Water Truck. In order to eliminate these problems, the water bar and associated channel will be grouted using an 8" concrete slab. This will prevent the channel from eroding. [Figure 7-15](#) shows a typical cross-section of the concrete crossing. A steel bridge structure and swell provides vehicle crossing as shown in the figure. The bridge is designed so that the water bar design cross-section is maintained passing under it. [The water bar has been removed from service to allow the main access road to be widened to accommodate safer travel through the area. It was replaced with C-14D so that drainage area AD-13 will continue to drain into Pond "B". This also eliminated or reduced the erosion problem occurring on the roadside of Pond "B" where the water bar drained into Pond "B".](#)

Figure 7-15 Ditch D-8D Water Bar Concrete Structure

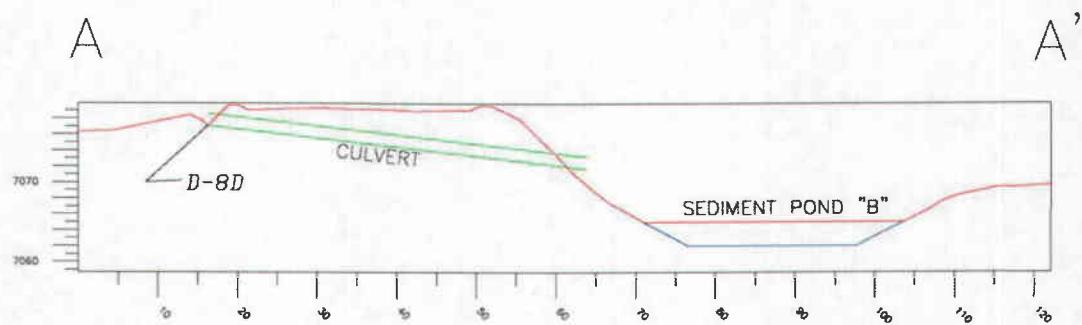
Typical Cross-Section

Swell present to divert all
Runoff into sediment pond



Minimum Channel Depth = 0.67'
Mimimum Required Depth = 0.33'

Figure 7-15A Cross-Section A-A' Culvert C-14D



WATERSHED CHARACTERISTICS

Disturbed Areas

P = 1.5"

<u>Watershed</u>	<u>CN</u>	<u>Area (Ac.)</u>	<u>Slope y (%)</u>	<u>Hyd length 1 (ft.)</u>	<u>$\frac{1}{S=-10}$ CN</u>	<u>$\frac{L}{1900Y^5}$</u>	<u>T=1.67L</u>	<u>Time of Conc (hr)</u>
1AD-1A	76	3.70	66	1,300	3.16	0.050		0.090
AD-1B	76	2.12	95.5	520	3.16	0.022		0.037
AD-2A	76	0.97	72	440	3.16	0.020		0.040
AD-2B	83	1.08	59	320	2.05	0.015		0.025
AD-2C	83	0.25	64	140	2.05	0.007		0.012
AD-3A	76	1.49	70	400	3.16	0.021		0.034
AD-3B	76	0.78	71	400	3.16	0.020		0.034
AD-4	83	0.08	49	100	2.05	0.007		0.011
AD-5	76	2.13	73	760	3.16	0.034		0.056
AD-6	90	1.39	1.7	720	1.11	0.131		0.220
AD-7	90	2.95	8.0	1,130	1.11	0.087		0.145
AD-8 upper	90	0.70	70	400	1.11	0.013		0.021
AD-8 lower	90	2.79	1.0	600	1.11	0.148		0.247
AD-9	90	0.35	7.2	420	1.11	0.042		0.069
AD-10 upper	90	0.30	34	320	1.11	0.015		0.026
AD-10 lower	90	0.65	2.0	220	1.11	0.047		0.078
AD-11	95	0.69	20	110	0.53	0.007		0.011
AD-12 upper	90	0.22	64	340	1.11	0.012		0.020
AD-12 lower	90	0.34	8.0	500	1.11	0.045		0.076
AD-13	91	1.78	8.0	800	0.99	0.063		0.106
AD-14	90	0.08	61	120	1.11	0.005		0.009
AD-15	90	1.83-2.19	10.5	530	1.11	0.041		0.069
AD-16*	90	0.77	22	303	1.11	0.018		0.030
AD-17*	90	0.24	27	190	1.11	0.011		0.019
AD-18	90	0.9	3.2	771	1.11	0.102		0.170
AD-19*	90	0.15	49.24	109	1.11	0.005		0.009
AD-20*	90	0.47	30.48	204	1.11	0.0113		0.019

*Areas AD-16, AD-17 and AD-19 are ASCA areas treated by alternate sediment controls.

WATERSHED CHARACTERISTICS
 Undisturbed Areas
 and ASCA Areas Not Reporting To Sediment Pond

<u>Watershed</u>	<u>CN</u>	<u>Area (Ac.)</u>	<u>Slope y (%)</u>	Hyd length 1 (ft.)	<u>1000 S=-10 CN</u>	<u>L=1900Y⁵</u>	<u>P = 1.5"</u> <u>T=1.67L</u>	<u>Time of Conc (hr)</u>
AU-1	76	6.46	57	1,240	3.16	0.056		0.094
AU-1A	83	1.36	65	460	2.05	0.019		0.032
AU-1B	83	1.16	59	330	2.05	0.015		0.026
AU-1C	76	<u>16.40</u> <u>16.04</u>	72	1,950	3.16	0.072		0.120
AU-2	76	2.23	62	975	3.16	0.045		0.075
AU-2A	76	1.64	63	1,025	3.16	0.046		0.077
AU-2B	76	3.80	63	1,100	3.16	0.049		0.081
AU-3	76	3.87	65	1,060	3.16	0.047		0.078
AU-3A	76	0.30	64	140	3.16	0.009		0.016
AU-4	76	7.97	63	1,300	3.16	0.056		0.093
AU-4A	83	0.92	52	357	2.05	0.018		0.029
AU-5	76	20.14	77.3	1,700	3.16	0.062		0.104
AU-6	76	2.73	70.0	780	3.16	0.035		0.059
AU-7	76	13.46	69.4	1,400	3.16	0.056		0.094
AU-8	76	4.95	85.7	720	3.16	0.030		0.050
AU-9	76	4.77	64.8	1,440	3.16	0.060		0.100
AU-10	76	35.52	76.1	2,380	3.16	0.082		0.137
AU-11	76	0.62	73.0	570	3.16	0.027		0.045
AU-12	76	2.33	44.1	480	3.16	0.030		0.050
AU-13	76	0.66	77.5	240	3.16	0.013		0.022
AU-14	76	2.43	66.7	620	3.16	0.030		0.050
AU-15	76	0.91	15.6	300	3.16	0.035		0.058
AU-16	76	<u>44.93</u>	71.0	2,580	3.16	0.091		0.152
AU-17	76	30.10	71.0	2,580	3.16	0.091		0.152
AU-18	76	36.55	71.0	2,580	3.16	0.091		0.152
AU-19	76	36.03	60.5	2,190	3.16	0.086		0.144
AU-20	76	20.55	57.6	1,880	3.16	0.078		0.131
AU-21	76	9.45	48.4	1,360	3.16	0.066		0.110
AU-22	76	12.05	60.3	1,120	3.16	0.051		0.084

Summary of Peak Flows for 10-year, 6-hour storm P=1.5"
 (SCS type B distribution)

<u>Watershed</u>	<u>Peak Q (cfs.)</u>	<u>Watershed</u>	<u>Peak Q (cfs)</u>	<u>Watershed</u>	<u>Peak Q (cfs)</u>
AD-1A	0.48	AU-1B	0.44	AU-23	0.78
AD-1B	0.32	AU-1B	0.44	AU-24	1.66
AD-2A	0.15	AU-1C	1.95	AU-25	0.30
AD-2B	0.41	AU-2	0.30	AU-26	0.10
AD-2C	0.10	AU-2A	0.22	AU-27	0.03
AD-3A	0.23	AU-2B	0.50	AU-28	0.10
AD-3B	0.12	AU-3	0.52	AU-29	0.29
AD-4	0.03	AU-3A	0.05	AU-29A	0.67
AD-5	0.30	AU-4	1.02	AU-30	0.08
AD-6	0.81	AU-4A	0.35	AU-31	0.32
AD-7	1.83	AU-5	2.51	AU-32	0.28
AD-8 upper	0.48	AU-6	0.39	AU-33	0.11
AD-8 lower	1.59	AU-7	1.72	AU-34	0.27
AD-9	0.23	AU-8	0.72	AU-35	0.13
AD-10 upper	0.20	AU-9	0.60	AU-36	0.12
AD-10 lower	0.42	AU-10	4.05	AU-37	13.64
AD-11	0.65	AU-11	0.09	AU-38	1.15
AD-12 upper	0.15	AU-12	0.34	AU-39	0.18
AD-12 lower	0.22	AU-13	0.10	AU-40	15.96
AD-13	1.23	AU-14	0.35	AU-41	1.46
AD-14	0.05	AU-15	0.13	AU-42	0.67
AD-15	1.20 <ins>1.44</ins>	AU-16	4.92	AU-43	1.75
AD-16	1.24	AU-17	3.29	BEAR CREEK	108.18
AD-17	0.16	AU-18	4.00	BEAR CREEK ¹	412.70
AD-18	0.55	AU-19	4.03		
AD-19	0.10	AU-20	2.37		
AU-1	0.83	AU-21	1.15		

PEAK
HYDROGRAPH GENERATION PROGRAM

INPUT SUMMARY FOR W.S.: AD-14

STORM:	WATERSHED:
Distribution = SCS Type 'B' Precip. Depth = 1.50 in Duration = 6.00 hr	Curve Number = 90 Time of Conc. = 0.009 hrs Area = 0.08 ac

OUTPUT SUMMARY

Runoff depth = 0.6835 in Initial Abstraction = 0.2222 in Peak Flow = 0.05 cfs (0.6792 iph) At T = 2.50 hrs

INPUT SUMMARY FOR W.S.: AD-15

STORM:	WATERSHED:
Distribution = SCS Type 'B' Precip. Depth = 1.50 in Duration = 6.00 hr	Curve Number = 90 Time of Conc. = 0.069 hr Area = 4.83 <u>2.19</u> ac

OUTPUT SUMMARY

Runoff depth = 0.6835 in Initial Abstraction = 0.2222 in Peak Flow = <u>1.20</u> <u>1.44</u> cfs (0.6506 <u>0.6513</u> iph) At T = 2.501 hrs

PEAK
HYDROGRAPH GENERATION PROGRAM

INPUT SUMMARY FOR W.S.: AU-1B

STORM:	WATERSHED:
Distribution = SCS Type 'B' Precip. Depth = 1.50 in Duration = 6.00 hr	Curve Number = 83 Time of Conc. = 0.026 hr Area = 1.16 ac

OUTPUT SUMMARY

Runoff depth = 0.3788 in Initial Abstraction = 0.4096 in Peak Flow = 0.44 cfs (0.3753 iph) At T = 2.50 hrs

INPUT SUMMARY FOR W.S.: AU-1C

STORM:	WATERSHED:
Distribution = SCS Type 'B' Precip. Depth = 1.50 in Duration = 6.00 hr	Curve Number = 76 Time of Conc. = 0.120 hr Area = 16.40 <u>16.04</u> ac

OUTPUT SUMMARY

Runoff depth = 0.1873 in Initial Abstraction = 0.6316 in Peak Flow = 1.95 cfs (0.1180 iph) At T = 2.54 hrs

Worksheet Worksheet for Circular Channel

Project Description

Worksheet	C-8D
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data

Mannings Coefficient	0.024
Slope	060000 ft/ft
Diameter	18 in
Discharge	1.23 cfs

Results

Depth	0.30 ft
Flow Area	0.3 ft ²
Wetted Perimeter	1.39 ft
Top Width	1.20 ft
Critical Depth	0.41 ft
Percent Full	20.1 %
Critical Slope	0.016734 ft/ft
Velocity	4.86 ft/s
Velocity Head	0.37 ft
Specific Energy	0.67 ft
Froude Number	1.87
Maximum Discharge	14.99 cfs
Discharge Full	13.94 cfs
Slope Full	0.0026 ft/ft
Flow Type	Supercritical

B.C.

7G-107

7/15/08

DITCH CHARACTERISTICS

DITCH	CHANNEL SLOPE %	CONTRIBUTING WATERSHED	PEAK Q(cfs)	BANK AND BOTTOM DESC.	MANNING'S $\eta^{(a)}$
D-1D	2 Min, 11 Max	AD-3A	0.23	Rocky Soil	0.03
D-2D	6 Min, 20 Max	AD-3A, AD-5	0.53	Rocky Soil, Bedrock	0.03
D-3D		Replaced with C-5D			
D-4D	2 Min, 7 Av 17 Max	AD-14	0.05	Soil	0.03
D-5D		Replaced with C-5D			
D-6D	2 Min, 4 Max	AD-3A, AD-5, AD-7 AD-9, AD-10, AD-12 AD-14	3.63	Rocky Soil	0.03
D-7D	2 Min, 6 Av 55 Max	AD-1A, AD-1B, AD-2A AD-2B, AD-2C, AD-3B AD-4, AD-6, AD-8	4.90	Soil $D_{50} \leq 3"$	0.03 0.033
D-8D	2 Min, 7 Max	AD-13	1.23	Soil	0.03
D-8D Water Bar	3 Av.	AD-13	1.23	Soil	0.013
D-9D	4 Min, 10 Max	AD-15	1.20 <u>1.44</u>	Soil	0.03
D-10D	7 Min, 50 Max	AD-6, AD-3B, AD-2C	1.03	$D_{50} \leq 4"$	0.033
D-11D	41 Min Near Vertical Max	TIPPLE WASH HOSE	0.25	Grouted rip-rap	0.035
D-12D	81 Av.	TIPPLE WASH HOSE	0.25	Grouted	0.03
D-13D Water Bar	0.5 Av.	AD-6 Partial	0.23	Soil	0.03
D-14D	0.06 Av.	AU-4A	0.35	Soil	0.03
D-15D	0.05 Av.	AD-16	1.24	Soil	0.03
D-16D	0.05 Av.	AD-18	0.55	Soil	0.03
D-17D	0.08	AU-23,AD-20	0.99		

Worksheet Worksheet for Trapezoidal Channel

Project Description

Worksheet	DITCH D-9D
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data

Mannings Coefficient	0.030
Slope	0.040000 ft/ft
Left Side Slope	1.00 V : H
Right Side Slope	1.00 V : H
Bottom Width	1.00 ft
Discharge	1.44 cfs

Results

Depth	0.31 ft
Flow Area	0.4 ft ²
Wetted Perimeter	1.87 ft
Top Width	1.55 ft
Critical Depth	0.35 ft
Critical Slope	0.024744 ft/ft
Velocity	3.56 ft/s
Velocity Head	0.20 ft
Specific Energy	0.51 ft
Froude Number	1.26
Flow Type	Supercritical

Use Minimum Depth = 1 ft
Velocity < 5 fps

Minimum Freeboard = 0.69 ft
No rip-rap required

B.C.

7G-130

05/09/08

Worksheet

Worksheet for Trapezoidal Channel

Project Description

Worksheet	DITCH D-9D (Max Slope)
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data

Mannings Coefficient	0.030
Slope	0.100000 ft/ft
Left Side Slope	1.00 V : H
Right Side Slope	1.00 V : H
Bottom Width	1.00 ft
Discharge	1.44 cfs

Results

Depth	0.24 ft
Flow Area	0.3 ft ²
Wetted Perimeter	1.67 ft
Top Width	1.47 ft
Critical Depth	0.35 ft
Critical Slope	0.024744 ft/ft
Velocity	4.941 ft/s
Velocity Head	0.37 ft
Specific Energy	0.61 ft
Froude Number	1.94
Flow Type	Supercritical

B.C.

7G-131

05/09/08

Pavement

02220-875-1750 (Pavement Removal 3")

Area = ~~1,450~~ 4,182 square yards (~~1,200~~ 4,008 at Bath-House, 174 at load-out)

Cost = (\$3.85 /sq yd) (1,374 sq yd) = \$5,290 16,101

Time = (1,374 sq yd) / (420 sq yd/day) = 3.27 9.96 days

Asphalt will be relayed at Trail Canyon

Volume = ~~(114~~ 348 CY) (2 tons/yd) (1.3 swell factor) = 297 905 Tons

16 ton truck; distance to haul approx. 4 miles round trip = ~~3-8~~ 57 trips/day

Time = ~~(114~~ 348 cu yd)/(128 cu yd/day) = 0.89 2.72 days

01590-200- 5300 Dump Truck Cost = (\$823.88/day) (2.72 days) = \$824 2,472

Cost Subtotal	\$ 6,114 <u>18,573</u>
Time Subtotal	4.2 <u>12.7</u> days

Shower House

02220-100-0100 (Framed Portion, includes disposal)

Volume = (92 ft) (50 ft) (8 ft) = 36,800 cu ft

Cost = (\$ 0.24 /cu ft) (36,800 cu ft) = \$ 8,832

Dump Fee = ((36,800 cu ft) / 27) (0.3 rubble volume) (1.35 tons/cy) (\$7.00/ton) = \$3,864

Time = (36,800 cu ft) / (20,100 cu ft/day) = 1.83 days

02220-100-0080 (Masonry Portion, includes disposal)

Volume = (92 ft) (50 ft) (8 ft) = 36,800 cu ft

Boot wash Volume = (12 ft) (5.5 ft) (8 ft) = 528 cu ft

Cost = (\$ 0.24 /cu ft) (37,328 cu ft) = \$ 8,959

Dump Fee = ((37,328 cu ft) / 27) (0.3 rubble volume) (1.35 tons/cy) (\$7.00/ton) = \$3,919

Time = (37,328 cu ft) / (20,100 cu ft/day) = 1.86 days

Concrete Demolition

Foundation Volume = (0.67 ft) (2 ft) (284 ft) = (380.6 cu ft) / 27 = 14.1 cu yds

Footing Volume = (0.67 ft) (2 ft) (319 ft) = (427.5 cu ft) / 27 = 15.8 cu yds

Floor Volume = (92 ft) (50 ft) (0.33 ft) = (1518 cu ft) / (27) = 56.2 cu yds

Boot wash Floor Volume = (12 ft) (5.5 ft) (0.33 ft) = (21.8) / 27 = 0.81 cu yds

Total Volume = 86.9 cu yds

Cost = (86.9 CY) (\$12.78/CY) = \$1,111

Time = (638 s.f.) / (180 s.f./day) + (319 L.F.) / (300 L.F./day) + (4,666 s.f.) / (500 s.f./day) = 13.94 days

02220-875-5550 (Concrete Disposal on Site) 002315-400-1300 (3 CY loader) 02320-200-0320
(16 ton truck)

Volume = (86.9 CY) (1.3 swell factor) = 113.0

Cost = (113 CY) (\$10.69/CY) = \$1,208

Time = (113 cu. yds) / (232 cu. yds/day) = 0.49 days

Cost Subtotal	\$ 27,893
Time Subtotal	18.12 days

Scale House and Sediment Pond B (TS-3)

See Appendix 3L, Table 3L-2

Cut Subtotal	1,454 cu yds
Fill Subtotal	1,454 cu yds

Sediment Pond "A" (TS-4)

See Appendix 3-L, Table 3L-3.

~~Cut (350 sq ft) x (120ft) = 42,000 cu ft =~~
~~Fill (350 sq ft) x (120ft) = 42,000 cu ft =~~

Cut Subtotal = 3,460 cu yds
Fill Subtotal = 3,460 cu yds

Shower House and Sediment Pond C (TS-9)

See Appendix 3-L5-I, Table 3L5I-8.

~~Cut (500 sq ft) x (185ft) = 92,500 cu ft =~~
~~Fill (500 sq ft) x (185ft) = 92,500 cu ft =~~

Cut Subtotal = 5,85110,954 cu yds
Fill Subtotal = 5,85110,954 cu yds

Wild Horse Ridge (TS-12 thru TS-15)

See Appendix 3-O, Table 3O-2, 3 & 4

Cut Subtotal = 23,641 cu yds
Fill Subtotal = 23,641 cu yds

Note: Approximately 12,500 cu yds of the Wild Horse Ridge volume will be regraded using a D9 dozer, and the remaining volume will be regraded using a 330BL Excavator.

Wild Horse Ridge Tank Seam (TS-16 thru TS-17)

See Appendix 3-P.

Cut Subtotal	11,089 cu yds
Fill Subtotal	11,089 cu yds

Cut Total = 112,025 cu yds
Fill Total = 112,025 cu yds

SOIL PLACEMENT

Areas	Time	Earth			Equipment		
		Cost	Moved	Cu Yds	Used	Cost/hr	(hrs)
Tank Seam Access Road & Portal Pad (TS-10 & TS-11) Fill		Cut 20,310		20,310 330BL		\$153.13	20.2 \$ 3,093
			Hauled	10,661			
Upper Storage Pad (TS-8)	Cut	3,666 Fill		7,022	330BL	\$153.13	14.6 \$ 2,236
Portal Pad Area & Road (TS-7)		Cut Fill	6,445 18,037	330BL		\$153.13	37.7 \$5,773
Portal Access Road (TS-6)	Cut	8,126 Fill Excess Cut	5,573 2,553	330BL		\$153.13	11.65 \$ 1,784
				included in fill volumes above			
Coal Storage Pad (TS-5)		Cut Fill Excess Cut	40,585 25,157 15,428	D9 Cat		\$190.80	50.3 \$ 9,597
				included in fill volumes above			
Scale House/ Sed Pond B (TS-3)		Cut Fill	1,454 1,454	D9 Cat		\$190.80	2.9 \$ 553
Sediment Pond "A" (TS-4)	Cut	3,460 Fill		3,460	D9 Cat	\$190.80	6.9 \$ 1,317
Shower House/ Sed Pond C (TS-9)	Cut	-5,851 <u>10,954</u> Fill		-5,851 <u>10,954</u>	D9 Cat	\$190.80	11.7 <u>21.9</u> \$ 2,232 <u>4,178</u>
Wild Horse Ridge Area*** (TS-12 thru TS-15)	Cut	11,141 12,500 Fill		330BL D9 Cat 23,641		\$153.13 \$190.80	23.3 25.0 \$ 3,568 \$ 4,770
Wild Horse Ridge Tank Seam (TS-16 thru TS-17)	Cut	1,016		D9 Cat		\$153.13	1.87 \$ 286
	Fill	11,089	10,073	330BL		\$190.80	20.1 \$ 3,835
Totals		Cut	110,462	<u>125,138</u>			219.82 <u>236.42</u>
		Fill	110,708	<u>126,697</u>			\$ 39,044 <u>40,990</u>
							(27.48 days)

*See Appendix 3-L and the following page.

**Excess Cut will be hauled from TS-5 and TS-6 to TS-7 and TS-8, as discussed in Appendix 3-L.

***Wild Horse Ridge material being relocated with the excavator will be hauled an average distance of 200 ft, as shown on the following pages.

e. Revegetation

Hydroseeding (Section 9.5)

C0150256 (Hydro Spreader)

Area = 38.3 38.7 acres = 1,669 1,686 MSF

Cost = (\$19.85 20.95/MSF) (1,669 1,686 MSF) = \$33,130 35,322

C0150255 (Tractor Spreader)

Area = 38.3 38.7 acres = 1,669 1,686 MSF

Cost = (\$10.28 12.71/MSF) (1,669 1,686 MSF) = \$17,157 21,429

C0150251 (Seed Material)

Area = 38.3 38.7 acres

Cost = (\$974.10 533.38/acre) (38.3 38.7) = \$37,308 20,642

C0150253 (Hydromulch)

Area = 38.3 38.7

Cost = (\$410.25 523.95/acre) (38.3 38.7) = \$15,712 20,277

C0150252 (3,704 10,700 Seedlings)

Cost = (\$0.77 1.71 each) (3834 10,700) = \$2,952 18,297

02370-550-0120 Install Matting (Section 9.5)

Cost = (\$7.5 7.00 sys) (29,040 4,840) = \$ 217,800 203,280

02315-400-0260 (Pocking)

Cost = (\$1.56 1.86/cu yd) (29,689 340 cu yd) = \$46,315 10,435

Assume 25% reseeding = \$92,594 82,420

Time = (38.3 38.7 acres) / (4 acres/day) = 9.58 9.68 days

Cost Total \$462,968 412,102

Time Total 9.58 9.68 days

f. Monitor Well Plugging

Assume \$5,000 per well

The above listed costs include reclamation costs added between 1985 and the latest modification.

Bear Canyon Mine C/015/025

Bond Amount

Revised April 2008

Bonding Calculations
Bear Canyon Mine

Bond Summary

Direct Costs

Subtotal Demolition and Removal	\$380,418.00
Subtotal Backfilling and Grading	\$326,625.00
Subtotal Revegetation	\$492,702.00
Direct Costs	\$1,199,745.00

Indirect Costs

Mob/Demob	\$119,975.00	10.0%
Contingency	\$59,987.00	5.0%
Engineering Redesign	\$29,994.00	2.5%
Main Office Expense	\$81,583.00	6.8%
Project Management Fee	\$29,994.00	2.5%
Subtotal Indirect Costs	\$321,533.00	26.8%

Total Cost	\$1,521,278.00
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Escalation factor	0.038
Number of years	5
Escalation	\$311,861.00

Reclamation Cost	\$1,833,139.00
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Bond Amount (rounded to nearest \$1,000) 2013 dollars	\$1,833,000.00
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Bond Posted 2005 dollars	\$1,825,000.00
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Difference Between Cost Estimate and Bond	-\$8,000.00
Percent Difference	-0.44%

next midterm	4/2/2013
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Printed 9/30/2008

Total

Pages 1

	Equipment Cost	Hourly Operating Costs	Operator's Hourly Wage Rate	Equipment Overhead	Number of Men or Eq.	Total Eq & Lab. Costs	Units	Quantity	Production Rate	Equip. + Labor Time/Ds.	Units	Cost
Bear Canyon Mine Earthwork												
Tank Seam No 01												33981
Upper Storage Pad No 02												3608
Portal Pad Area No 03												9081
Portal Access Road No 04												5008
Lower Road Switchback No 05												0
Tipple Access Road No 06												0
Coal Storage Pad												40684
Scale House												658
Sediment Ponds												1603
Shower House												5146.8
Borehole No 12												29059
Wild Horse Ridge												36927
Support												38918
Riprap No 14												121951
Total												326624.8

	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq & Lab. Costs	Units	Quantity	Production Rate	Equip. + Labor Time/Ds.	Units	Cost
Bear Canyon Mine													
Crating													
Shower House													
D9R Semi-U EROPS (9-52) (2H2007)	19405	95.3	0.1	60.1	286.21	1	286 \$/HR	10934 CY	623 CY		17.6 CY		5034
Rip Pavement													
14H EROPS	10655	45.5	0.1	60.1	176.74	1	177 \$/HR	1.53 AC	2.6 ac/hr	0.6 hr	106.2		
B185 HP and over	970	4.05	0.1		10.52	1	11 \$/HR	1.53 AC	2.6 ac/hr	0.6 hr	6.6		
Volume													
Total													5146.8

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swal Factor	Quantity	Unit	Cost
Main Mine Site 01																				
Revegetation																				
Dill Seeding																				
Dill Seeding	Tractor Sprayer (equip. & labor) B-66	Reved004	13.34 /MSF	\$/AC																
Seed Material	Bear Canyon Main Mine Shrubs	Bear Canyon 001	166.00 \$/AC	\$/AC																
Seed Material	Bear Canyon Main Mine Forbs	Bear Canyon 002	149.00 \$/AC	\$/AC																
Seed Material	Bear Canyon Main Mine Grass	Bear Canyon 003	158.00 \$/AC	\$/AC																
Mulch	Tractor Sprayer (equip. & labor) B-66	Reved004	13.34 /MSF	\$/AC																
Mulch	Hay 1" material only 32' x 13' 16' D550	Reved001	56.00 /MSF	\$/AC																
Stock Labor	Bare root seedlings 11" to 16" med. soil	32' x 43' 0.0140	175/Ea																	
Stock Material	Bear Canyon Main Transplants	Bear Canyon 004	3.95 \$/AC	\$/AC																
Ripping	300 HP Dozer w/ Ripper	31' 23" 16' 32' 28' 30'	0.42/CY	CY																
Subtotal																				3345 CY 03344
Number 2 Mine Area																				
Hydroseeding	Hydro Spreader (equip. & labor) B-81 8M	Reved002	18.54 /MSF	\$/AC																
Seed Material	Bear Canyon Main Mine Shrubs	Bear Canyon 001	166.00 \$/AC	\$/AC																
Seed Material	Bear Canyon Main Mine Forbs	Bear Canyon 002	149.00 \$/AC	\$/AC																
Seed Material	Bear Canyon Main Mine Grass	Bear Canyon 003	158.00 \$/AC	\$/AC																
Mulch	Hay 1" material only 32' x 13' 16' D550	Reved001	56.00 /MSF	\$/AC																
Stock Labor	Bare root seedlings 11" to 16" med. soil	32' x 43' 0.0140	175/Ea																	
Stock Material	Bear Canyon Main Transplants	Bear Canyon 004	3.95 \$/AC	\$/AC																
Packing 340 CY/AC																				
Subtotal																				3193 CY 03847
Riparian Planting Area																				
Plant Stock	Bear Canyon Main Mine Grass	Bear Canyon 008	888 \$/AC	\$/AC																
Subtotal	Bare root seedlings 11" to 16" med. soil	32' x 93' 43' 0.0140	1.75/Ea																	1790
Matting																				
Matting	Revegetation mat. webbed	31' 25" 13' 10' 0.120	7.05/SY	SY																
Subtotal																				
Total																				32659.5
Reseeded																				
Assume 25% reseeding																				
Subtotal																				81640
Total																				416200